

## Alg. 2 Warm Up #11-1

Find all the angles between 0 and  $2\pi$  that are solutions to the following equation. Answer in exact radians.

1.  $\sin x = \frac{\sqrt{3}}{2}$       2.  $\cos \theta = -\frac{\sqrt{2}}{2}$       3.  $\tan x = -1$

4.  $\tan \theta = \frac{\sqrt{3}}{3}$       5.  $\sin \theta = -1$       6.  $\cos x = 0$

## HW Questions:

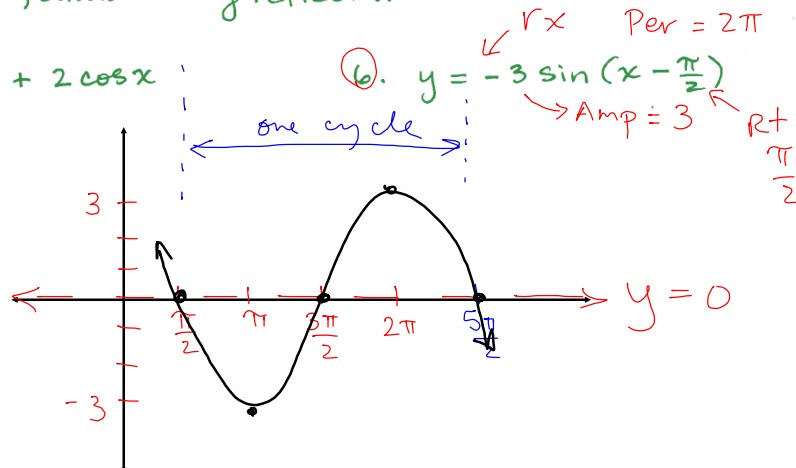
Convert from radians  $\longleftrightarrow$  degrees (No calculator)

1.  $\frac{3\pi}{2}$       2.  $\frac{4\pi}{9}$       3.  $100^\circ$       4.  $36^\circ$

Find the period, amplitude, equation for the line of oscillation (the midline), consider any reflections or shifts and sketch the graph:

5.  $y = 4 + 2\cos x$

6.  $y = -3\sin(x - \frac{\pi}{2})$



7.  $y = \sin 2x + 1$

Per =  $\pi$

Amp = 1

line of Osc  $y = 1$

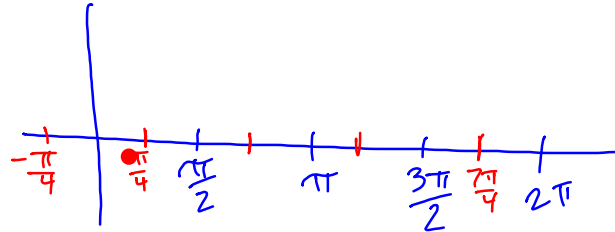
$b = 2$

$\frac{2\pi}{2}$

8.  $y = 3 + \sin(x + \frac{\pi}{4})$

up 3  $\rightarrow$  line of osc  $\rightarrow y = 3$

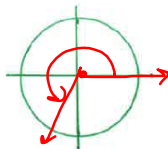
left  $\frac{\pi}{4}$  Amp = 1 Per =  $2\pi$



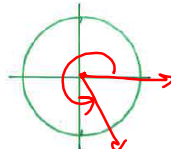
graph the first  
cycle between  $-\frac{\pi}{4}$   
and  $\frac{7\pi}{4}$

Draw the following angles on the unit circle:

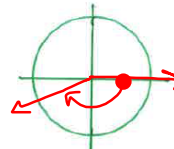
9.  $\frac{4\pi}{3}$



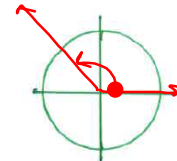
10.  $\frac{10\pi}{6} = \frac{5\pi}{3}$



11.  $-\frac{5\pi}{6}$



12.  $\frac{3\pi}{4}$



use your unit circle to find:

13.  $\sin \frac{7\pi}{4}$

14.  $\cos \frac{4\pi}{3}$

15.  $\tan \frac{\pi}{2}$

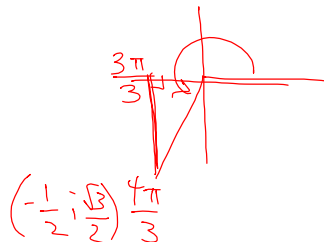
$\frac{1}{0}$   
undefined

16.  $\sin(-\frac{\pi}{6})$

same as

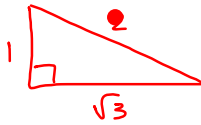
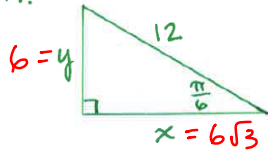
$\frac{11\pi}{6}$

$-\frac{1}{2}$

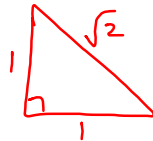
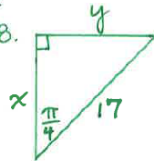


Find  $x$  &  $y$  exact:

17.



18.



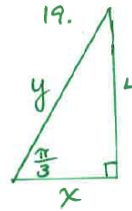
$\text{hyp} = \text{leg}(\sqrt{2})$

$17 = x\sqrt{2}$

$x = \frac{17}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}}$

$x = \frac{17\sqrt{2}}{2}$

19.



long leg = sh. leg  $(\sqrt{3})$

$4 = x(\sqrt{3})$

$\frac{4}{\sqrt{3}} = x$

$x = \frac{4\sqrt{3}}{3}$

double for hypotenuse!

20.

If  $\cos \theta = -\frac{\sqrt{3}}{2}$

Find  $\theta$

Describe the transformations of the parent graph to get:

21.

$y = -2 + 4\cos(2x - \pi)$   
 $\cos 2(x - \frac{\pi}{2})$   
 horizontal compression  
 $R + \frac{\pi}{2}$   
 vertical stretch  
 down 2

22.

$y = -\frac{1}{3}\sin x + 8$   
 up 8  
 vertical compression  
 reflection in the x-axis

23.

$y = \tan(x - \frac{\pi}{6}) - 4$

24.  $y = \frac{2}{3}\cos(4x + \pi)$   
 $4(x + \frac{\pi}{4})$   
 vertical compression  
 reflection in the x-axis

Solve. Answer exact &amp; simplified.

25.  $3^{x+5} \cdot 9 = 3^{4x}$

$$3^{x+5} \cdot 3^2 = 3^{4x}$$

$$3^{x+7} = 3^{4x}$$

$$x+7 = 4x$$

$$7 = 3x$$

$$x = \frac{7}{3}$$

26.  $4 \log_3 2 = \log_3 x + \log_3 2x$

$$\log_3 2^4 = \log_3 2x^2$$

$$16 = 2x^2$$

$$x^2 = 8$$

$$x = \pm\sqrt{8}$$

$$x = \pm 2\sqrt{2}$$

extraneous

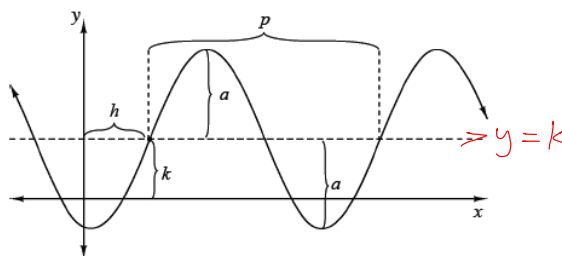
$$x = 2\sqrt{2}$$



## METHODS AND MEANINGS

p. 360

## General Equation for Sine Functions

The general equation for the sine function is  $y = a \sin[b(x - h)] + k$ .

Per  
=  $\frac{2\pi}{b}$  ← The period is the length of one cycle. It is labeled  $p$  on the graph.

The amplitude (half of the distance between the highest and the lowest points) is  $a$ . Vertical stretch or compression

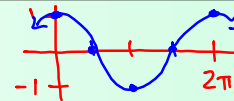
The number of cycles in  $2\pi$  is  $b$ .

The horizontal shift is  $h$ .

The vertical shift is  $k$ . The midline is  $y = k$ .

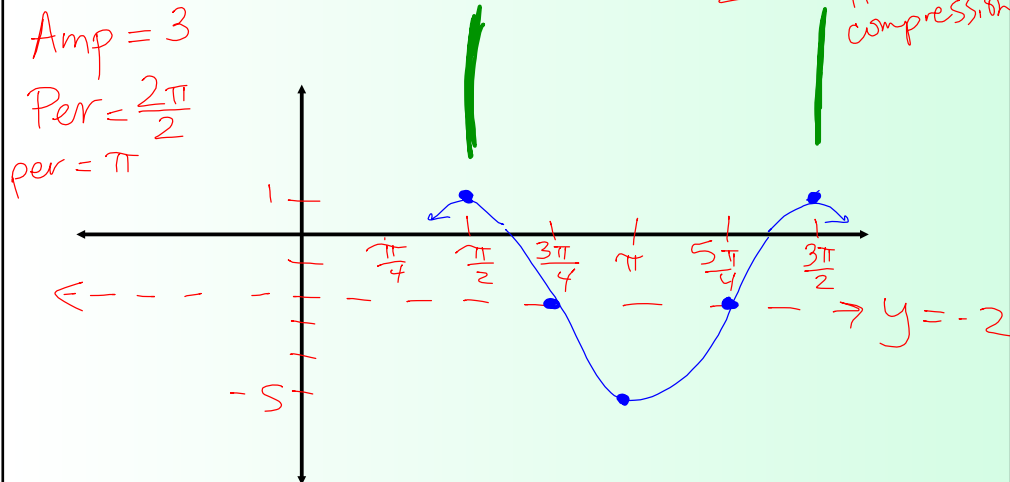
Practice:

Parent  $y = \cos x$   
vertical stretch of 3



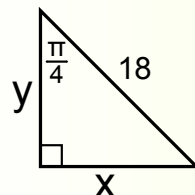
Describe the transformations of  $y = \cos x$  that give us  $y = 3 \cos(2x - \pi) - 2$ , then graph one cycle.

Label the line of oscillation.



Find  $x$  and  $y$ , exact and simplified.

1)



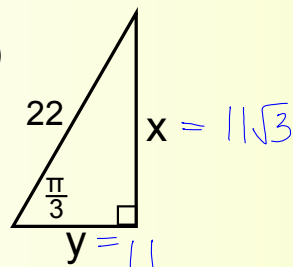
$$\text{hyp} = \text{leg}(\sqrt{2})$$

$$18 = x\sqrt{2}$$

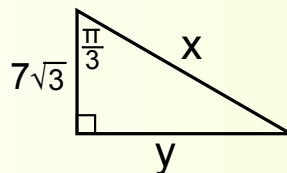
solve for  $x$

$$x = y = 9\sqrt{2}$$

2)



3)



$$\text{hyp} = 2(\text{sh. leg})$$

$$x = 2(7\sqrt{3})$$

$$x = 14\sqrt{3}$$

$$\text{long leg} = (\text{sh. leg})\sqrt{3}$$

$$y = 7\sqrt{3} \cdot \sqrt{3}$$

$$y = 21$$

Practice:

1)  $\log_2(5x + 6) = 3$

$$2^3 = 5x + 6$$

$$8 = 5x + 6$$

$$2 = 5x$$

$$x = \frac{2}{5}$$

3)  $2\log_3(x + 1) = 2$

$$\log_3(x + 1)^2 = 2$$

$$3^2 = x^2 + 2x + 1$$

$$0 = x^2 + 2x - 8$$

$$0 = (x + 4)(x - 2)$$

$$x = -4, 2$$

2)  $\log_4(x - 6) + \log_4 x = 2$

$$\log_4(x^2 - 6x) = 2$$

$$4^2 = x^2 - 6x$$

$$0 = x^2 - 6x - 16$$

$$0 = (x - 8)(x + 2)$$

$$x = 8, -2$$

HW: page CP 25,

# 1 - 25 odd

In the checkpoint section, back of the book.

\*Go over the yellow review worksheet!

Chapter Test: Tomorrow

(No calculator)